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ABSTRACT

This paper discusses the use of an interactive computer system as a major component of instruction for the graduate level introductory educational statistics course at the University of Maine at Orono. Four major computer topics are covered in the statistics course: (1) terminal and computer operation, (2) Montana State University Interactive Statistical Analysis Program (MSUSTAT), (3) the CMS Editor, and (4) the Statistical Package for the Social Sciences (SPSS). These topics are introduced sequentially during the first six weeks of the semester. The major objective is for the students to be able to use SPSS; the other three topics provide the prerequisite skills. Four references are listed and the appendices include a course syllabus for the summer, 1981; instructions on how to use the Interactive Statistics Program; instructions for using the terminal; three study guides; and instructions for card order and deck setup for generating and processing SPSS files. (CHC)

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USING AN INTERACTIVE COMPUTER
SYSTEM TO TEACH STATISTICAL
METHODS IN EDUCATION

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U.S. DEPARTMENT OF HEALTH,
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Abstract

The introductory graduate level educational statistics course at the University of Maine at Orono is taught using an interactive computer system. The students enter the course with no skills in educational statistics nor any skills in the utilization of computers. By the end of the course, the students are proficient in basic statistical techniques used in educational research and in the use of the computer to calculate the statistics. The major computer packages utilized include MSUSTAT Interactive Statistical Analysis Package and the Statistical Package for the Social Sciences.

Research Paper presented at the American Educational Research Association Annual Meeting in Los Angeles, 13 April 1981.

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IR009712

USING AN INTERACTIVE COMPUTER SYSTEM TO TEACH
STATISTICAL METHODS IN EDUCATION

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The graduate level introductory educational statistics course at the University of Maine at Orono uses an interactive computer system as a major component for instruction. This course is the beginning of the graduate level educational research course sequence. The purpose of the course is to introduce basic techniques and statistics and to introduce the utilization of computers for statistical analysis. The students include doctoral candidates as well as master's candidates who are in thesis programs. The course has no prerequisite other than admission to the graduate school. The students are not required to have any specific mathematical background nor do they need knowledge on the utilization of the computer.

The University of Maine operates a relatively large main frame computer which is an IBM 3031 machine with a VM/370 operating system. The machine supports academic and administrative computing on the Orono campus, as well as other campuses and remote locations throughout the state. Any programs and systems available on the Orono campus are also available at any remote location. This allows part-time students to use computer terminals around the state in the same way that full-time students use the computer on the Orono campus. This is particularly useful for students who are returning to full-time positions after completing their residency on the Orono campus.

Research Paper presented at the American Educational Research Association Annual Meeting in Los Angeles, 13 April 1981.

The students are taught to use those computer systems which are useful for educational statistics. There are other courses within the College which deal with topics such as computer-assisted instruction and administrative data processing. The four major computer topics covered in the statistics course are: 1) terminal and computer operation, 2) Montana State University Interactive Statistical Analysis Program (MSUSTAT) (Lund, 1979), 3) CMS Editor, and 4) the Statistical Package for the Social Sciences (SPSS) (Nie, et al, 1975; Hull and Nie, 1979). These topics are introduced sequentially during the first six weeks of the semester. The major objective is for the students to be able to use SPSS. The other three topics provide the prerequisite skills which are necessary to use SPSS.

During the early weeks of the course, the students are given detailed directions on the operation of the computer. The instructions become less and less detailed as the course progresses. By the end of the semester, the instruction relating to computer usage entails only a few minutes during a lecture on a specific statistical concept.

The statistical topics covered in the course are very similar to most introductory graduate level statistics courses. The text used is Basic Statistics for Education and Behavioral Sciences by Weinberg and Goldberg (1979). As shown in the course schedule (Appendix A), the students spend eight weeks on descriptive statistics and six weeks on inferential statistics. The utilization of the computer in this course is interwoven with the statistical concepts starting on the first day of class.

On the first day of class, the students are introduced to the computer terminals and to the commands necessary to access the university computer. The instructions which are provided to the students are included in Appendix B. The students utilize a system called CMS Environment which is an interactive system used for instructional purposes. Each student is assigned a virtual machine identification number and a password which allows complete access to the system.

The students are typically anxious about the prospect of using a computer in their class. This fear seems to be the result of lack of experience with computers. This fear will vanish within the next few years, as more high school and undergraduate students use computers at school and at home. To overcome this fear, the students' first assignment is to play games on the computer. The games are very simple to play; while at the same time, they arouse interest on the part of the students. This activity serves an additional purpose of helping the students to learn the special keys on the terminal.

During the second class session, the students are introduced to the Montana State University Interactive Statistical Analysis Package (MSUSTAT). This package was developed by Richard E. Lund in the Statistical Center, Department of Mathematical Science at Montana State University. The MSUSTAT package is very easy to use while at the same time being a robust computer program. The instructions for using MSUSTAT and a sample job are included in Appendix C.

This MSUSTAT system runs completely interactively and allows the student to compute relatively simple statistics with only a small number of commands. Since the students have already run similar procedures when they played the games, they find no difficulty in using the MSUSTAT package. The first MSUSTAT procedure which the students learn is the MEANSTD procedure. This procedure computes the mean and standard deviation for a set of numbers which the students type on the terminal. During the next couple of classes, the students are also introduced to other MSUSTAT procedures, including HISTOGRAM, SUMSTAT (summary descriptive statistics) and NPCORR (correlations).

The MSUSTAT package has the capability to use input and output files. The students are introduced to these capabilities during the third class. Examples of the use of these files are included in Appendices D, E, and F. The output files are produced directly by the MSUSTAT package. The input files are prepared by the student using the CMS Editor.

The CMS Editor is a file maintenance program which is available through the CMS Environment System. The Editor allows the students to create and change files. These files are stored on magnetic disks and can be retrieved immediately by the student when needed.

The Editor is fairly typical of the editors found on most computer systems. The Editor allows the student to create a new file, to look at an old file, to locate specific lines within a file, and to move around within the file. The Editor also has the ability to add new lines, delete old lines, and change parts of lines.

After the students have mastered the Editor, they start using the input file capabilities of the MSUSTAT package. As the number of values for each variable increases, the need for an input data file becomes more apparent to the students. At this time, the students also learn to write format statements for MSUSTAT which are identical to the SPSS format statements since both packages are supported by a FORTRAN compiler.

The Statistical Package for the Social Sciences (SPSS) is run in a batch mode system on the University of Maine computer. The design of the university computer allows the interactive systems to send jobs to the batch systems and for the batch systems to route the output back to the interactive system. Thus, the students can create an SPSS job on the interactive system and then send it to the batch system where it is actually run. The job which the students create is a set of card images which contain the same information as a traditional computer card. The information, however, is stored on disks and the cards are never physically created.

The students learn the basic language for an SPSS command and run a simple job which includes the basic SPSS commands. This simple job is included in Appendix G. To assist in editing the job, the card images are split into three separate files. The first file contains the data definition cards through the "read input data" card. The second file contains the input data for the study. The third file includes the end of the SPSS commands starting with the "end input data" card. The students are initially taught the data definition commands, including variable list and input format. Since they have already used the format specification statement in the MSUSTAT package, this becomes an easy task. They are also taught

about procedure commands starting with two relatively simple procedures including Pearson Corr, Scattergram, and condescriptive. The students then are given an assignment to actually run an SPSS job.

Additional data definition commands are introduced separately over the next couple of weeks. These commands include: 1) recode, 2) missing variables, 3) if, 4) compute, 5) select if, 6) *select if, 7) edit, 8) variable labels, 9) value labels, and 10) comment.

During the remaining weeks of the semester, the students are introduced to the SPSS procedures corresponding to the statistical concepts being presented in a given lecture. These procedures include: 1) frequencies, 2) crosstabs, 3) breakdown, 4) t-test, 5) non-par corr, 6) ANOVA, and 7) one-way. Since the students have already mastered the basics of using SPSS and are comfortable using the interactive system of the computer, they can utilize SPSS with their homework assignments and during their individual studies.

A number of conclusions have been reached as a result of using the computer in this statistics class. The students can very quickly master the Statistical Package for the Social Sciences in a relatively short period of time. The students can also understand from a statistical standpoint the printouts which SPSS provides, because the class topics and SPSS are inter-related during class presentations. The students do have some problems dealing with the intangibleness and abstractness of the ineractive computer system. Since their files exist only as a series of electronic signals,

they cannot hold the files like they could a deck of computer cards. The students, however, are able to deal with this problem by the end of the semester.

The organization of this course is a departure from our previous practice. In the past, the students started directly on the SPSS package with actual cards in a batch mode. This procedure had several drawbacks including the relative complexity of the SPSS system for the novice user, the difficulty in accurately key punching data, and the slow turn-around-time necessitated by a batch mode. With the new system, the commands for the statistical procedures are very easy to execute, the terminal is easier to use than a key punch machine and the student receives immediate feedback. The students can, therefore, master the statistical concepts and computer processing without becoming bogged down in the mechanics of key punching and programming.

Overall, this has been a successful experience both from a faculty standpoint and from a student standpoint. The student evaluations of the course have been very high with many students changing from a negative to positive attitude toward statistics during the semester. The quality of the students' thesis and dissertation research is also improving, because the students can concentrate on the research rather than mastering the computer.

References

Hull, C, Hadlai and Nie, Norman H., SPSS Update: New Procedures and Facilities for Releases 7 and 8. New York: McGraw-Hill, 1979.

Lunt, Richard E. A User's Guide to MSUSTAT: An Interactive Statistical Analysis Package. Bozeman: Montana State University, 1979.

Nie, Norman H.; Hull, C. Hadlai; Jenckins, Jean G.; Steinbreener, Karin; Bent, Dale H. SPSS: Statistical Package for the Social Sciences, 2nd Edition. New York: McGraw-Hill, 1975.

Weinberg, Sharon L., and Goldberg, Kenneth P. Basic Statistics for Education and the Behavioral Sciences. Boston: Houghton-Mifflin Company, 1979.

EdA 321

Summer 1981

Schedule

Reading assignments are in parentheses and should be completed by the date indicated. This schedule is subject to change due to the pacing of the course.

- June 22 Overview of educational statistics (Chap. 1)
 Distribution and graphs (Chap. 2)
 Using the computer terminal

 Help session, 1:00-2:00 p.m., 12 Shibles
- June 23 Central tendency (Chap. 3)
 Variability and standard deviation (Chap. 4)
 Interactive Statistics Package (ISP)

 Help session, 1:00-2:00 p.m.
- June 24 Correlation (Chap. 5)
 CMS Editor

 Help session, 1:00-2:00
- June 25 Probability (Chap. 6)
 ISP input and output files

 Help session, 1:00-2:00
- June 26 Binomial Probability Experiments (Chap. 7)
 Introduction to Statistical Package for the Social Sciences (SPSS)

 Help session, 1:00-2:00
- June 29 Exam on Chapters 1-5 (1 hour)

 Normal curve (Chap. 8)

 Help session
- June 30 Logic of hypothesis testing (Chap. 9)

 Help session
- July 1 Overview of inferential statistics (Chap. 10)

 Help session
- July 2 Interval estimation (Chap. 11)

 Help session
- July 3 Exam on Chapters 6-10 (1 hour)

 Hypothesis testing (Chap. 12)

 Help session

- July 6 t distribution (Chap. 13)
 Help session
- July 7 Tests of means for population (Chap. 14)
 Help session
- July 8 Tests on variances (Chap. 15)
 Help session
- July 9 Review
 Help session
- July 10 Final exam on entire course with emphasis on Chapters 11-15

EdA 321

Instructions on how to use the Interactive Statistics Program

To use the Interactive Statistics Program (ISP), you must first be connected with the Environment system. Type "ispl" and push the return key. The system may respond with "ERRO22: TEMP LIBRARY DOES NOT EXIST", which you should ignore. The system will respond in capital letters while everything you type will be in lower case letters. The system will then respond with a question (see sample): "DO YOU WANT TO USE AN INPUT FILE (TYPE YES OR NO)" You should type "no" and push the return key. The system will then ask "DO YOU WANT YOUR OUTPUT TO BE TYPED ON YOUR TERMINAL OR BE SAVED IN A FILE IN YOUR TEMPORARY LIBRARY? TYPE TERM FOR TERMINAL, THE FILENAME FOR A FILE" You should respond "term". At a later date, we will use additional capabilities of the ISP system and will respond differently to these questions. The system will then ask for the program desired and you should type "meanstd" and push the return key.

The system will then ask for input values and you should type one number after each request (see sample). On the sample the values are 33, 56, 87, 25, 55, and 89. After all the values are input, push the return key with nothing on the line. This tells the machine that you are finished listing values. The machine will now display the mean and standard deviation (std dev.) for the values you input. Congratulations! You have just used the computer to calculate a statistic. The system will again ask you to input values. Push the return key with a blank line. The system will then ask for the program desired and you should type "stop".

Try calculating the means for several different sets of values until you feel comfortable with the ISP system.

Sometimes a value will be expressed in scientific notation such as 3.25E2. The E2 means to move the decimal point two places to the right so that 3.25E2 is the same as 325. Similarly 4.655E2 is the same as 465.5. The number following the E indicates the number of columns the decimal point should be moved. A value expressed as 9.83457E4 is the same as 98345.7. If a negative value follows the E, the decimal point should be moved to the left. So that 4.75E-1 is the same as .475. Similarly, 7.43E-1 is the same as .743. Likewise 18.53-3 is the same as .0185.

While running the Interactive Statistical Program, the computer may tell you that an error has occurred. Errors occur very infrequently but can take a variety of forms. One which will appear on the ISP package is a "READ ERROR". This indicates that the computer did not understand the previous line which you sent when you hit the return key. You should retype the previous line and push the return key again.

The other error which creeps up now and again is an improper character sequence. The response from the computer will look some thing like the following:

"FIRST 80 CHARACTERS OF INPUT RECORD ARE-> 'SUNSTAT
PROGRAM WAS EXECUTING LINE 1770 IN ROUTINE INPUT2

PROGRAM WAS EXECUTING LINE 2220 IN ROUTINE MEANSD

PROGRAM WAS EXECUTING LINE 210 IN ROUTINE M/PROG

R; T=11.06/13.28 16:15:13"

This is a relatively severe error and causes the ISP package to stop functioning. To restart the package, you must type "ispl" and start over again.

Instructions for Using the Terminal

I. Finding a terminal

Room 12, Shibles Hall, two terminals (video and hardcopy)

Room 101, Shibles, one terminal (video)

Computer Center, Public Use Area, several terminals (video and hard copy)

Other locations, availability may vary.

The University of Maine computer may be accessed from numerous locations off campus. If you have access to one of these locations, please check with the instructor or with the terminal owner for operating instructions.

II. Establishing a communications line from the terminal to the computer

There are three basic types of communications lines: 1) hard wire (direct connection), 2) a data set, or 3) an accoustic coupler.

The first step in using any of these communications lines is to turn on the terminal. The on and off switch is located to either the right or left of the keyboard or under the screen. After the terminal is on, push the return key. If the phrase "CAPS ONLINE" appears on the screen, the communication line has been established and you should proceed to III below. If not, you must establish the communication line.

The data set is a strange-looking telephone with a series of buttons above the dial. The accoustic coupler uses a conventional telephone and has a device with things on the top which resemble suction cups.

If you have a data set, push in the button labeled "line" on the telephone and lift the receiver. You should hear a regular dial tone. Dial one of the following numbers: 6, 5, 2321, 2322, 2324, 2325, 2326, 2327, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2431, 2426, 2424. You should hear a high-pitched beep. If you don't hear the high-pitched beep, the line is busy and you should try another number. When you have a high-pitched beep, push in the "data" button and hang up the receiver. Push the return key on the terminal and the system should respond with "CAPS ONLINE" or an audible click. You have now established a communication line and are ready to logon as described under III below.

If you have an accoustic coupler, dial any of the four digit numbers listed under "data set" but not the single digits 5 and 6. When you have a high-pitched beep, place the telephone receiver into the suction cups and push down. Push the return key on the terminal and the system should respond with either "CAPS ONLINE" or an audible click.

- III. Now that you have established a communications line between the terminal and the computer, you must "logon". Type "logon iednnnnn" and push the return key. This number should be your account code with digits in place of the n's. The computer will then ask you for a password and you should respond with your password.

A hard copy terminal has a piece of paper. A video terminal has a television screen with no paper copy.

The system will ask you to identify which kind of terminal you are using. You should respond "ha" for hard copy and "vi" for video.

The computer will then type several lines and will stop after typing a line beginning with "R". You are now connected with the Environmental System of the computer and are ready to run your jobs. The computer will allow you only 28 seconds to log on. If you fail to log on successfully in this time, the computer may disconnect your communication line.

You should be very careful not to let other people inadvertently learn your password. Anyone who knows your password can have access to your data files and could very easily destroy them.

- IV. The keys of the computer terminal are like a normal typewriter with a couple of exceptions. You can eliminate an error by typing the "@" on a hard copy or the back space key on the video terminal. This key allows the user to delete one or more of the previous characters in the event of minor typing errors. Typing two "@" signs in a row will eliminate the previous two characters. For example, "abc@" becomes "a", "ab@c" becomes "ac".

The "␣" key on the hard copy terminal or the "E" on the video terminal will eliminate everything on the current line. Sometimes it is easier to eliminate the entire line, while at other times it is easier to eliminate only a few characters. These keys will only correct errors on the current line before you push the return key. If you discover an error after pushing the return key, the error is more difficult to correct.

The numbers one (1) and zero (0) are on the line of keys with other numerals. Don't use the letters "l" and "O" for numbers and vice versa.

Normally, everything which you type on the terminal will be in lower case letters. Anything typed by the computer will be in capital letters.

EdA 321

Instructions for Using the Terminal

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If you have an acoustic coupler, dial any of the four digit numbers listed under "data set" but not the single digits 5 and 6. When you have a high-pitched beep, place the telephone receiver into the suction cups and push down. Push the return key on the terminal and the system should respond with either "CAPS ONLINE" or an audible click.

- III. Now that you have established a communications line between the terminal and the computer, you must "logon". Type "logon iednnnnn" and push the return key. This number should be your account code with digits in place of the n's. The computer will then ask you for a password and you should respond with your password.

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The system will ask you to identify which kind of terminal you are using. You should respond "ha" for hard copy and "vi" for video.

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The "␣" key on the hard copy terminal or the "␣" on the video terminal will eliminate everything on the current line. Sometimes it is easier to eliminate the entire line, while at other times it is easier to eliminate only a few characters. These keys will only correct errors on the current line before you push the return key. If you discover an error after pushing the return key, the error is more difficult to correct.

The numbers one (1) and zero (0) are on the line of keys with other numerals. Don't use the letters "1" and "0" for numbers and vice versa.

Normally, everything which you type on the terminal will be in lower case letters. Anything typed by the computer will be in capital letters.

SAMPLE

isp1
DO YOU WANT TO USE AN INPUT FILE? (TYPE YES OR NO)
no
DO YOU WANT YOUR OUTPUT TO BE TYPED ON YOUR TERMINAL
OR BE SAVED IN A FILE IN YOUR TEMPORARY LIBRARY?
TYPE TERM FOR TERMINAL, THE FILENAME FOR A FILE
term
NOW I AM SETTING UP ISP1. PLEASE BE PATIENT.

INTERACTIVE STATISTICAL ANALYSIS PACKAGE, R.E.LUND
MONTANA STATE UNIVERSITY, JAN., 1980.

PROGRAM DESIRED (OR HELP, NEWS, STOP*) =
monnsed

CALCULATES MEAN & STD DEVIATION.

INPUT 1 TO 20 VALUES PER LINE (USE BLANK TO STOP):

1 :
33
2 :
56
3 :
87
4 :
25
5 :
55
6 :
89
7 :

MEAN (6) = 57.50
STD DEV = 26.56

INPUT 1 TO 20 VALUES PER LINE (USE BLANK TO STOP):

1 :

PROGRAM DESIRED (OR HELP, NEWS, STOP*) =
stop

....EXECUTION ENDS

R; T=0.00/0.06 08:48:11

isp1

DO YOU WANT TO USE AN INPUT FILE? (TYPE YES OR NO)

yes

PLEASE TYPE IN THE NAME OF YOUR INPUT FILE

correxam

DO YOU WANT YOUR OUTPUT TO BE TYPED ON YOUR TERMINAL

OR TO BE SAVED IN A FILE IN YOUR TEMPORARY LIBRARY?

TYPE TERM FOR TERMINAL, THE FILENAME FOR A FILE

term

NOW I AM SETTING UP ISP1, PLEASE BE PATIENT.

****INTERACTIVE STATISTICAL ANALYSIS PACKAGE, P.F.LUND****

MONTANA STATE UNIVERSITY, JAN., 1980.

PROGRAM DESIRED (OR HELP, NEWS, STOP*) =

npcorr

PRODUCES SUMMARY STATISTICS, SPEARMAN RANK AND PEARSON CORRELATIONS, CASES EXCEEDING N = 200 ARE IGNORED IN SPEARMAN, TIES ARE GIVEN MID-RANKS, R-VALUES FOR RANKING TESTS ARE LARGE SAMPLE APPROXIMATIONS. USE A TABLE FOR SMALL SAMPLES.

OUTPUT UNIT (TERM* OR FILE NAME) =

term

INPUT SOURCE (TERM* OR FILE NAME) =

correxam

DATA INPUT FORMAT (*SPACE DELIMITERS) =

(t7,f2.0,1x,f3.0)

NUMBER OF INPUT VARIABLES (2* TO 20) =

2

NUMBER OF ANALYZER VARBLES (*NO. INPUT)=

DATA TRANSFORMATIONS (YES OR NO*) =

PEARSON CORRELATIONS (YES OR NO*) =

yes

SPEARMAN RANK CORRELATIONS (YES OR NO*)=

no

NUMBER OF CASES (*END OF FILE) =

FIRST CASE = 75.00 175.0

CASES READ = 5

VARIABLE 1 2

MEAN (5)= 65.00 155.0

STD DEV = 7.906 15.81

SKEWNESS = 0.0000 0.0000

KURTOSIS = 1.700 1.700

MAXIMUM = 75.00 175.0

CORRELATION= 1.000

P-VALUE = 0.000

RESTART WITH SAME CONTROL (YES OR NO*) =

no

```

isp1
DO YOU WANT TO USE AN INPUT FILE? (TYPE YES OR NO)
yes
PLEASE TYPE IN THE NAME OF YOUR INPUT FILE
correxam
DO YOU WANT YOUR OUTPUT TO BE TYPED ON YOUR TERMINAL
OR TO BE SAVED IN A FILE IN YOUR TEMPORARY LIBRARY?
TYPE TERM FOR TERMINAL, THE FILENAME FOR A FILE
output
NOW I AM SETTING UP ISP1. PLEASE BE PATIENT.

```

****INTERACTIVE STATISTICAL ANALYSIS PACKAGE, D. E. LUND****
MONTANA STATE UNIVERSITY, JAN., 1980.

```

PROGRAM DESIRED (OR HELP, NEWS, STOP*) =
npcorr

```

PRODUCES SUMMARY STATISTICS, SPEARMAN RANK AND PEARSON
 CORRELATIONS, CASES EXCEEDING N = 200 ARE IGNORED IN SPEARMAN.
 TIES ARE GIVEN MID-RANKS, P-VALUES FOR RANKING TESTS ARE
 LARGE SAMPLE APPROXIMATIONS. USE A TABLE FOR SMALL SAMPLES.

```

OUTPUT UNIT (TERM* OR FILE NAME)      =
output
INPUT SOURCE (TERM* OR FILE NAME)     =
correxam
DATA INPUT FORMAT (*SPACE DELIMITERS) =
(t7,f2.0,1x,63.0)
NUMBER OF INPUT VARIABLES (2* to 20)   =
2
NUMBER OF ANALYZED VARBLES (*NO, INPUT)=
DATA TRANSOFRMATIONS (YES OR NO*)     =
PEARSON CORRELATIONS (YES OR NO*)     =
yes
SPEARMAN RANK CORRELATIONS (YES OR NO*)=
NUMBER OF CASES (*END OF FILE)        =
RESTART WITH SAME CONTROL (YES OR NO*)=
no

```

```

PROGRAM DESIRED (OR HELP, NEWS, STOP*) =
stop

```

R; T=9.50/11.32 08:50:53

EdA 321

Study Guide

Sample Files

R; T=0.00/0.02 09:01:50

edit correxam

EDIT:

t a

00010 75 175

00020 70 165

00030 65 155

00040 60 145

00050 55 135

EOF:

file

R; T=0.06/0.27 09:04:14

Sample Input File

R; T=0.00/0.02 08:59:14

edit output (temp

EDIT:

t a

FIRST CASE = 75.00 175.0

CASES READ = 5

CASES READ = 5

Sample Output Files

VARIABLE 1 2

MEAN (5)= 05.00 155.0

STD DEV = 7.906 15.81

SKEWNESS = 0.0000 0.0000

KURTOSIS = 1.700 1.700

MAXIMUM = 75.00 175.0

MINIMUM = 55.00 135.0

CORRELATION= 1.000

P-VALUE = 0.0000

IOF:

file

R; T=0.05/0.26 09:00:10

keep output

R; T=0.05/0.18 09:00:34

edit output

EDIT

t a

FIRST CASE = 75.00 175.0

CASES READ = 5

CASES READ = 5

VARIABLE 1 2

MEAN (5)= 65.00 155.0

STD DEV = 7.906 15.81

SKEWNESS = 0.0000 0.0000

KURTOSIS = 1.700 1.700

MAXIMUM = 75.00 175.0

MINIMUM = 55.00 135.0

CORRELATION= 1.000

P-VALUE = 0.0000

EOF:

file

R; T=0.08/0.35 09:01:34

GENERATING AND PROCESSING SPSS FILES: CARD ORDER AND DECK SETUP

Required	/*			Job Control Lines
Required	/JOB IED322nn IED322 BOX174 Your Name			
Required	SPSS8.OM			
Card Status	Control Field	Remarks	Precedence	
Required	VARIABLE LIST or DATA LIST		5	Data Definition Lines
Conditional	INPUT FORMAT	Required if a VARIABLE LIST card is used	8	
Optional	MISSING VALUES		8	
Optional	VAR LABELS		8	
Optional	VALUE LABELS		8	
Required	Procedure Card ¹		10	Task Definition Lines for the First Task
Optional	OPTIONS		11	
Optional	STATISTICS		11	
Required	READ INPUT DATA		12	
Lines containing the data for cases appear here when the data is being input.				
Required	END INPUT DATA			Task Definition Lines for Subsequent Tasks
The next set of task definition cards appears here if desired.				
Optional	Procedure Card ¹			
Optional	OPTIONS			
Optional	STATISTICS			
Required	FINISH		Last Card	
Required	/*			Job Control Lines
Required	/*			

¹ To be replaced by the desired procedure card such as CROSSTABS, REGRESSION, FREQUENCIES, etc.